

REMARKS

The undersigned attorney wishes to thank the Examiner for the courtesies extended during the Interviews, during which the Final Office Action, including the 35 USC § 112 first and second paragraph rejections contained therein, and amendments to the claims that would overcome these rejections, were discussed.

Claims 27, 30, 32, 41, 58 and 59 have been cancelled, without prejudice.

As requested by the Examiner and in order to correct a typographical error, the specification has been amended to replace "E" with --°-- in paragraph [0051]. This amendment is formal in nature and does not introduce new matter.

Claims 22 and 23 have been amended for clarity to replace the recitation of "polynucleotide fragment" with --DNA--. This amendment is formal in nature and does not narrow the scope of the claims in any manner.

As requested by the Examiner, claims 24-26, 28, 29 and 57 have been amended to recite the specific subunits of *Gluconobacter oxydans* cytochrome c oxidase with which the subunit encoded by the recombinant DNA forms a complex having cytochrome c oxidase activity. Support for these amendments is found in the specification at, for example, pages 3-4, ¶¶ [0008]-[0011].

Claims 25, 26, 28 and 29 have further been amended to recite the specific subunit of a ***Gluconobacter oxydans*** cytochrome c oxidase encoded by the recombinant DNA. Support for these amendments is found in the specification at, for example, page 3, ¶¶ [0007]-[0008] and pages 4-5, ¶¶ [0012]-[0015].

Claims 31 and 40 have been amended to remove the recitation of polynucleotide sequences and instead to depend from "any one of claims 22-26, 28 and

29.” Support for these amendments is found in original claims 31 and 40, respectively, and in the specification at, for example, page 16, ¶¶ [0053]-[0054]. See, In re Gardner, 177 USPQ 396, 397 (CCPA 1973) and MPEP §§ 608.01 (o) and (l).

Claim 36 has been amended to correct a typographical error by removing the duplicate occurrence of the term “wherein.” This amendment is formal in nature and does not narrow the scope of the claim in any manner.

Claims 43 and 44 have been amended to depend from claim 40. Support for these amendments is found in original claims 43 and 44, respectively, and in the specification at, for example, page 16, ¶ [0054]. (*Id.*).

Claim 46 has been amended to remove the recitation of recombinant DNAs and instead to recite a recombinant microorganism --according to claim 40--. Support for this amendment is found in original claim 46, and in the specification at, for example, page 7, ¶ [0021]. (*Id.*).

Claim 48, 49 and 50 have been amended to depend from claim 46. Support for these amendments is found in original claims 48, 49 and 50, respectively, and in the specification at, for example, page 16, ¶¶ [0054]-[0055]. (*Id.*).

Claim 48 has further been amended for the sake of consistency with claim 46, from which amended claim 48 depends, to replace the term “bacteria” with --microorganism--. This amendment is formal in nature and does not narrow the scope of the claim in any manner.

Claim 49 has further been amended for the sake of clarity to recite that the microorganism is --obtained from-- *Gluconobacter oxydans* DSM 4025. This

clarifying amendment is formal in nature and does not narrow the scope of the claim in any manner.

Claim 50 has further been amended to replace the term "biological or taxonomic homolog" with --biologically and/or taxonomically homogeneous culture--. Support for this amendment is found in the specification at, for example, pages 9-10, ¶ [0034] and page 16, ¶¶ [0054]-[0055].

As requested by the Examiner and for the sake of clarity, claim 57 has further been amended to remove the parenthesis, to insert the term --comprising-- after the term "conditions," and to remove the recitation of "gentle rocking." This clarifying amendment is formal in nature and does not narrow the scope of the claim in any manner.

Claim 60 has been amended for the sake of clarity to replace the term "is isolated from a" with --comprises-- and further, to specify that the complex includes --cytochrome *c* oxidase core subunits I and II--. Support for this amendment is found in original claim 60 and in the specification at, for example, page 3, ¶ [0009]. (*Id.*).

As recommended by the Examiner and for the sake of clarity, claims 61 and 65 have been amended to replace the phrase "has the following properties" with --comprises--, to insert the term --a-- before the term "core," and to specify that --the complex displays-- the recited absorption spectrum. These clarifying amendments are formal in nature and do not narrow the scope of the claims in any manner.

Claim 63 has been amended to recite that core subunit II comprises SEQ ID NO: 4. Support for this amendment is found in original claim 63 and in the specification at, for example, page 4, ¶ [0013]. (*Id.*).

Claim 64 has been amended to depend from claim 26. Support for this amendment is found in the specification at, for example, page 3, ¶ [0009].

Claim 64 has further been amended for the sake of clarity to specify that the subunits are --cytochrome c oxidase subunits--. This clarifying amendment is formal in nature and does not narrow the scope of the claim in any manner.

Claims 65 and 66 have been amended to depend from claim 26. Support for these amendments is found in the specification at, for example, pages 3-4, ¶¶ [0009]-[0010].

Claim 67 has been amended to depend from claim 26 and further, to recite that core subunit I comprises SEQ ID NO: 2. Support for this amendment is found in original claim 67 and in the specification at, for example, page 4, ¶ [0012]. (*Id.*).

Claim 68 has been amended to depend from claim 29. Support for this amendment is found in the specification at, for example, page 10, ¶ [0035].

Claim 68 has further been amended for the sake of clarity to specify that the subunits are --cytochrome c oxidase subunits--. This clarifying amendment is formal in nature and does not narrow the scope of the claim in any manner.

Claim 69 has been amended to depend from claim 29. Support for this amendment is found in the specification at, for example, pages 8-9, ¶ [0033].

As recommended by the Examiner and for the sake of clarity, claim 69 has further been amended to remove the phrase "the complex has the following properties" and to recite that the --core subunits I and II-- have the indicated molecular masses, and to specify that --the complex displays-- the recited absorption spectrum.

Application No.: 09/712,768
Amendment Dated: November 11, 2000
Reply to Office Action mailed: February 7, 2003

This clarifying amendment is formal in nature and does not narrow the scope of the claim in any manner.

Claim 70 has been amended to depend from claim 29. Support for this amendment is found in the specification at, for example, page 4, ¶ [0010].

Claim 71 has been amended to depend from claim 29 and further, to recite that core subunit I comprises SEQ ID NO: 2. Support for this amendment is found in original claim 71 and in the specification at, for example, page 4, ¶ [0012]. (*Id.*).

Claim 72 has been amended to recite an expression vector --comprising at least one recombinant DNA-- according to --any one of claims 60, 64 and 68--. Support for this amendment is found in original claim 72 and in the specification at, for example, page 6, ¶ [0019]. (*Id.*).

Claim 73 has been amended to recite an expression vector --comprising at least one recombinant DNA-- according to --any one of claims 61, 65 and 69--. Support for this amendment is found in original claim 73 and in the specification at, for example, page 6, ¶ [0019]. (*Id.*).

Claim 74 has been amended to recite an expression vector --comprising at least one recombinant DNA-- according to --any one of claims 62, 66 and 70--. Support for this amendment is found in original claim 74 and in the specification at, for example, page 6, ¶ [0019]. (*Id.*).

Claim 75 has been amended to recite a recombinant microorganism --comprising at least one recombinant DNA-- according to --any one of claims 60, 64

and 68--. Support for this amendment is found in original claim 75 and in the specification at, for example, pages 6-7, ¶ [0020]. (*Id.*).

Claim 76 has been amended to recite a recombinant microorganism --comprising at least one recombinant DNA-- according to --any one of claims 61, 65 and 69--. Support for this amendment is found in original claim 76 and in the specification at, for example, pages 6-7, ¶ [0020]. (*Id.*).

Claim 77 has been amended to recite a recombinant microorganism --comprising at least one recombinant DNA-- according to --any one of claims 62, 66 and 70--. Support for this amendment is found in original claim 77 and in the specification at, for example, pages 6-7, ¶ [0020]. (*Id.*).

Claim 78 has been amended to recite a process for producing a cytochrome c oxidase complex --comprising: (a) cultivating in a culture medium a recombinant microorganism according to claim 75; and (b) recovering cytochrome c oxidase from the culture--. Support for this amendment is found in original claim 78 and in the specification at, for example, page 7, ¶ [0021]. (*Id.*).

Claim 79 has been amended to recite a process for producing a cytochrome c oxidase complex --comprising: (a) cultivating in a culture medium a recombinant microorganism according to claim 76; and (b) recovering cytochrome c oxidase from the culture--. Support for this amendment is found in original claim 79 and in the specification at, for example, page 7, ¶ [0021]. (*Id.*).

Claim 80 has been amended to recite a process for producing a cytochrome c oxidase complex --comprising: (a) cultivating in a culture medium a recombinant microorganism according to claim 77; and (b) recovering cytochrome c

Application No.: 09/712,768
Amendment Dated: November 11, 2000
Reply to Office Action mailed: February 7, 2003

oxidase from the culture--. Support for this amendment is found in original claim 80 and in the specification at, for example, page 7, ¶ [0021]. (*Id.*).

It is submitted that no new matter has been introduced by the foregoing amendments. Approval and entry of the amendments is respectfully solicited.

Objections to the Specification

The specification was objected to for containing an "informality." (Paper No. 13 at 2). In making the objection the Examiner asserted that "on page 15, '42EC' and '37EC' are typed where it appears '42°C' and '37°C' were intended." (*Id.*) With a view towards furthering prosecution, the specification has been amended as set forth above to correct the informality. Accordingly, it is respectfully submitted that the objection is rendered moot and should be withdrawn.

Claim Objections

Claim 50 was objected to under 37 C.F.R. § 1.7(c) "as being of improper dependent form for failing to further limit the subject matter of a previous claim" (claim 49). (Paper No. 13 at 2). With a view towards furthering prosecution, claim 50 has been amended to depend from claim 46. It is respectfully submitted that amended claim 50 further limits the subject matter of claim 46. Accordingly, the rejection is rendered moot and should be withdrawn.

Application No.: 09/712,768
Amendment Dated: November 11, 2000
Reply to Office Action mailed: February 7, 2003

§112, Second Paragraph Rejections

Claims 31-50, 57-62, 64-66, 68-70 and 72-80 were rejected under 35 U.S.C. § 112, second paragraph. (Paper No. 13 at 9). In making the rejection, the Examiner asserted that “[c]laim 31, with dependent claims 33-39, is confusing as it is unclear whether a DNA that encodes several subunits or one subunit is implied.” (*Id.*).

With a view towards furthering prosecution, claim 31 has been amended to remove the allegedly unclear language and to depend from any one of claims 22-26, 28 and 29. Accordingly, it is respectfully submitted that the rejection is rendered moot and should be withdrawn.

In making the rejection, the Examiner further contended that “[c]laims 32 and 40-50 are confusing as it is unclear whether a DNA that encodes several subunits or one subunit is implied,” and “it is unclear which ‘combinations thereof’ are encompassed by the claims except for two additional subunits present in the complex.” (*Id.* at 10).

With a view towards furthering prosecution, claim 32 has been cancelled and claim 40 has been amended to remove the allegedly unclear language and to depend from any one of claims 22-26, 28 and 29. Accordingly, it is respectfully submitted that the rejection is rendered moot and should be withdrawn.

The Examiner further asserted that “[c]laims 57-59 contain brackets that are not allowed in the claims,” and “[t]he recitation of ‘gentle rocking’ is not necessary since this is well [known] because the solution contains radioactivity.” (*Id.*).

With a view towards furthering prosecution and as requested by the Examiner, claims 58 and 59 have been cancelled, without prejudice. Accordingly, the rejection with respect to claims 58 and 59 is rendered moot and should be withdrawn.

As recommended by the Examiner, claim 57 has been amended to remove brackets (we note that these are actually parenthesis- "(" and ")"), to insert the term --comprising-- after "high stringency conditions" and to remove the recitation of "gentle rocking." Accordingly, it is respectfully submitted that the rejection is rendered moot and should be withdrawn.

The Examiner further contended that "[w]ith regard to claim 60, it is unclear whether one recombinant DNA and [or] two non-recombinant DNAs are encompassed by the term 'complex'." (*Id.*).

With a view towards furthering prosecution, claim 60 has been amended to recite that the "complex comprises *Gluconobacter oxydans* DSM 4025 cytochrome c oxidase core **subunits I and II**." Accordingly, it is respectfully submitted that the rejection is rendered moot and should be withdrawn.

In making the rejection, the Examiner further asserted that "[w]ith regard to claims 61, 65, 69, 73, 76 and 79, core subunits are not 'properties'. The complex comprises them." (*Id.*).

With a view towards furthering prosecution and as requested by the Examiner, claims 61, 65, 69, 73, 76 and 79 have been amended to remove any recitation of "properties." In accordance with the agreement reached with the Examiner during the Interviews, it is respectfully submitted that the rejection is rendered moot and should be withdrawn.

The Examiner further contended that “[i]n claims 62, 66, 70, 74, 77 and 80, it is unclear which enzymes other than ‘cytochrome c oxidase’ are encompassed.” (*Id.*).

With a view towards furthering prosecution and as requested by the Examiner, claims 24, 26 and 29, from which claims 62, 66, 70, 74, 77 and 80 ultimately depend, have been amended to recite that the complex is formed of specific *Gluconobacter oxydans* cytochrome c oxidase subunits. In accordance with the agreement reached with the Examiner during the Interviews, it is respectfully submitted that the rejection is rendered moot and should be withdrawn.

The Examiner further asserted that “[w]ith regard to claims 64, 68, 72, 75 and 78, a DNA is either recombinant or isolated. If one subunit is recombinant the entire complex is not isolated.” (*Id.*).

With a view towards furthering prosecution and as requested by the Examiner, claims 64, 68, 72, 75 and 78 have been amended to remove the language objected to by the Examiner. In accordance with the agreement reached with the Examiner during the Interviews, it is respectfully submitted that the rejection is rendered moot and should be withdrawn.

§112, First Paragraph Rejections

1. Written Description

Claims 25-50, 58, 59 and 64-80 were rejected under 35 U.S.C. § 112, first paragraph. (Paper No. 13 at 3). In making the rejection, the Examiner asserted that:

The recited structural feature of the genus (i.e., encodes a fragment of 44, 38 or 29 amino acids) does not constitute a substantial portion of the genus as the remainder of the structure of a subunit that conveys cytochrome c oxidase activity when present with two other core subunits of cytochrome c oxidase from *Gluconobacter oxydans* DSM 4025 or to any other cytochrome c oxidase is completely undefined. (*Id.* at 4).

With a view towards furthering prosecution and as requested by the Examiner, claims 27, 30, 32, 41, 58 and 59 have been cancelled. Accordingly, the rejection with respect to claims 27, 30, 32, 41, 58 and 59 is rendered moot and should be withdrawn.

With a view towards furthering prosecution and as requested by the Examiner, claims 25, 26, 28 and 29 have been amended as set forth above to recite the specific subunit of a ***Gluconobacter oxydans*** cytochrome c oxidase encoded by the recombinant DNA and further, to recite the specific subunits of *Gluconobacter oxydans* cytochrome c oxidase with which the encoded subunit forms a complex having cytochrome c oxidase activity. In accordance with the agreement reached with the Examiner during the Interviews, it is respectfully submitted that the rejection is rendered moot and should be withdrawn.

2. Enablement

Claims 24-50 and 57-80 were rejected under 35 U.S.C. § 112, first paragraph. (Paper No. 13 at 5). In making the rejection, the Examiner asserted that:

...the specification, while enabling for a DNA fragment encoding SEQ ID NO: 2, 4, 6 or 8, does not reasonably provide enablement for a DNA comprising DNA fragment encoding SEQ ID NO: 4, 6 or 8 or a sequence that is 85% identical thereto or a DNA that hybridizes thereto under highly stringent conditions and that

conveys cytochrome c oxydase activity when present with two other core subunits of cytochrome c oxidase....” (*Id.*).

The Examiner further contended that “the specification does not provide a [sic] guidance as to other subunits of cytochrome c oxidase that must be present [in the complex].” (*Id.* at 8).

With a view towards furthering prosecution and as requested by the Examiner, claims 27, 30, 41, 58 and 59 have been cancelled. Accordingly, the rejection with respect to claims 27, 30, 41, 58 and 59 is rendered moot and should be withdrawn.

With a view towards furthering prosecution and as requested by the Examiner, claims 24-26, 28 and 29 have been amended as set forth above to recite the specific subunit of a ***Gluconobacter oxydans*** cytochrome c oxidase encoded by the recombinant DNA, and claims 25, 26, 28 and 29 have further been amended to recite the specific subunits of *Gluconobacter oxydans* cytochrome c oxidase with which the encoded subunit forms a complex having cytochrome c oxidase activity. In accordance with the agreement reached with the Examiner during the Interviews, it is respectfully submitted that the rejection is rendered moot and should be withdrawn.

Application No.: 09/712,768
Amendment Dated: November 11, 2000
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For the reasons set forth above, favorable action on the merits, including entry of the amendments, withdrawal of the rejections and objections, and allowance of all the claims, respectfully is requested. If the Examiner has any questions regarding this paper, please contact the undersigned attorney.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, Alexandria, VA 22313-1450, on November 11, 2003.



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